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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/92,880

11/05/2001

James D. Beasom

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06/17/2004

Attn: Scott Lundberg
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EXAMINER

PHAM, HOAI V

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/992,880

Applicant(s)

JAMES D. BEASOM

Examiner

Hoai V Pham

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11-37 and 56-66 is/are pending in the application.
- 4a) Of the above claim(s) 6-7, 56-64 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-37, 65 and 66 is/are allowed.
- 6) ☐ Claim(s) 1-5, 8 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-4, and 8-9 are rejected under 35 U.S.C. 102(a) as being anticipated by Lee et al. [U.S. Pat. 6,228,736] newly cited.

With respect to claim 1, Lee et al. (figs. 4-5, col. 4) discloses a method of forming a contact opening (1) through a dielectric layer (14) overlaying an oxide layer (12) in an integrated circuit, the method comprising:

forming a layer of mask material (16) overlaying and in contact with the dielectric layer (14) (see fig. 4);

patterning the layer of mask material (16) to expose a pre-selected portion of the dielectric layer (see fig. 4 and col. 4, lines 35-36); and

forming anisotropic contact opening (1) that extend through the layer of dielectric (14) and the layer of oxide (12) using a dry etch with a single mask (see fig. 5 and col. 4, lines 40-45).

With respect to claim 2, Lee et al. discloses removing the layer of mask material (see fig. 6 and col. 4, lines 46-47).

With respect to claim 3, Lee et al. discloses that the mask material (16) is photo resist mask material (see col. 4, lines 36-36).

With respect to claim 4, Lee et al. discloses that the patterning of the layer of mask material further comprises: removing a portion of the mask material (16) adjacent a portion of the dielectric layer (14) where the contact opening (1) is to be formed (see fig. 4 and col. 4, lines 35-36).

With respect to claims 8 and 9, Lee et al. discloses that the dielectric constant of the dielectric layer (14) is higher than the dielectric constant of the layer of oxide (12) and wherein the dielectric (14) is silicon nitride (see col. 4, lines 17-31).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. [U.S. Pat. 6,228,736] newly cited, in view of Lou [U.S. Pat. 6,468,858] previously applied.

Lee et al. discloses that the dry etch used is high density plasma. Lee does not disclose that the dry etch used is a reactive ion dry etch. However, Lou discloses that

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a reactive ion dry etch is a known technique to etch the dielectric and oxide layers (see col. 4, lines 39-45). Furthermore, an etchant gas mixture (CHF₃ or CF₄) of Lou is the same with the etchant gas mixture of Lee et al. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the known method of reactive ion dry etch or high density plasma into the process of Lee et al. because such etching techniques are equivalence for their use in the semiconductor art to etch the dielectric and oxide layers in order to form a contact opening.

Response to Arguments

3. Applicant's arguments with respect to claim 1-5 and 8-11 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

4. Claims 11-37 and 65-66 are allowed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai V Pham whose telephone number is 571-272-1715. The examiner can normally be reached on 9:30A.M. - 8:00P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Hoai Pham
June 3, 2004